

Ecstasy by design

by Paul White

A new wave of drug abuse has hit North America. It involves the use of new synthetic psychoactive drugs often referred to as 'designer drugs'. Made from readily available chemicals, designer drugs may pack many times the punch of cocaine or heroin, cost little to produce, and are rarely detected in ordinary drug tests.

Designer drugs are usually chemicals which are similar in structure to previously known psychoactive substances like

cocaine, heroin and mescaline. For example, heroin addicts on the west coast are discovering analogues of a surgical anesthetic called Fentanyl, some of which are much more potent than heroin.

Unlike the compounds whose effects they mimic most designer drugs are legal, at least until drug enforcement officials become aware of their widespread use.

Once outlawed, these drugs often recede underground to be produced in clandestine laboratories run by organized crime.

By far the most popular yet of the designer drugs is known on the streets as 'Ecstasy'. It is a psychoactive phenylisopropylamine with the proper name 3,4-methylenedioxymethamphetamine or MDMA. Its chemical structure places it somewhere between the stimulant amphetamines and the phenylethylamine hallucinogens such as mescaline.

Ecstasy was discovered in the early twentieth century by a German chemist who developed it as a prospective appetite

continued to page 5

Double helix: the key to cancer DNA

by Paul Stewart

Cancer research has experienced significant advances in the last few years. Unfortunately there is often a direct relationship between the rate of growth of such knowledge and the inaccuracy of its transfer to the public.

Most people see a tumor as some alien parasite, invading and destroying, the patient's doomed body. As seen from the viewpoint of modern researchers, however, a cancer growth behaves not unlike a growing embryo. Both, for example, have their beginnings as a single de-specialized cell whose DNA is given to the task of creating a preordained structure.

The invasion of body tissue

by a malignant tumor is even reminiscent of the way the placenta of the developing foetus invades the wall of the mother's uterus. Some benign tumors, called Teratomas, will produce such diverse tissues as hair, bone, and muscle in a jumbled attempt at recreating its parent organism.

Our bodies consist of many different tissues, acting together as organ systems, each with its own specialized task. To arrive at such a complex arrangement, cell reproduction in the embryo must produce increasingly more specialized generations of cells.

The fertilized egg becomes a ball of undifferentiated daughter cells called Morula, by expression of early 'embryonic' DNA programmes.

These are permanently switched off, as later 'foetal' programmes take over to control and shape the production of different tissues.

Finally, in the fully-grown adult, mature DNA functions in maintenance and control, repairing and replacing inevitably damaged or aging cells. These programmes are now being unlocked in human DNA, using the techniques of molecular biology.

Early work in this field consisted of removing a cell's DNA, chopping it into bits (sequences), and determining their complexity or 'uniqueness' within the entire set of sequences, or the genome, of the nucleus. The results were grouped into three classes: unique sequences which only occur once or twice

in the genome, intermediate repeats which may exist as dozens of identical copies, and highly redundant DNA consisting of thousands of similar sequences in tandem.

The function of each class may be inferred from its representative protein products, and it appears that the first two types comprise the majority of known growth, maintenance and metabolism. Their products include everything from digestive and metabolic enzymes to the myriad array of antibody molecules raised by the immune system cells to fight infections of all kinds.

But what of the highly redundant DNA? Until recently, most biologists considered this to be a remnant of evolution,

whereby ancestral messages were duplicated and inserted into genes end-to-end, allowing for a large degree of error in reproducing and 'reading' the message, as well as a buffer against genetic damage.

While a unique sequence must be repaired immediately and correctly in the event of a mutation, a set of a thousand such sequences may easily survive the mutation of only one or two in the set. For this reason, attention was centered on the more unique messages as being more likely to cause the cancerous return of a cell to the embryonic state, resulting in a tumor.

The damage done to DNA, causing such a mutation, is often ascribed to the actions of chemicals or radiation. Large molecules that contain ring structures and nitrogen are broken down by enzymes of the liver and gut called mixed-function oxidases. Often this detoxification machinery produces by-products called free radicals, atoms of oxygen or carbon which are highly reactive with the atoms on the surface of DNA.

Bound to the DNA of a cell, radicals prevent the proper decoding of the message in that segment. If not repaired, the 'bad' message can revert the cell to a cancerous state of growth.

Radiation can either break the structural backbone of DNA, or, in the case of ultraviolet light 'UV', fuse two adjacent DNA subgroups together. Either type of damage introduces error and can result in gut or skin cancer respectively.

The problem with this 'victims of our environment' view is that it overlooks the massive number of molecules existing in the nucleus for the sole purpose of repairing spontaneous or damage induced mutations. These repair enzymes may very well be produced and controlled by the highly redundant DNA. Since the 'goodness' of these enzymes determines the effectiveness of repair, it would seem that the degree of damage done to the programmes for these enzymes would determine the susceptibility of a cell to cancer.

This approach to carcinogenesis on the molecular level was first suggested on the clinical level in 1973 by Knudson and Strong. Their 'two-hit'

hypothesis stated that there are two types of cancer: heritable and spontaneous. Heritable cancer was predetermined in the patient by an inherited mistake in the DNA of the 'germ' cells: sperm and egg. By the time these germ cells fused and grew to form a human, the mistake would exist in every cell of the body. This first 'hit' would only express itself as a tumor if there was a second hit near the first one, caused by radiation or chemical damage.

Spontaneous cancer was suggested to arise in a cell if its DNA was 'hit' twice in the same area of function by such environmental influences.

Fitting the two-hit hypothesis into our model, one could suggest that, in most cancers, the first hit occurs in the redundant DNA, crippling the repair enzymes and allowing the second hit to go unrepaired. This would result in cancer only if the second mutation switched on dormant embryonic genes, removing the controls that prevent each cell from growing uncontrollably into a tumor.

This scenario encompasses the process of aging as well. Maintained in a culture dish, a normal human cell will divide only about 50 times before accumulated errors stop further growth and division, even in the presence of unlimited space and food. For less advanced species the number of divisions is less, and appears to be in proportion to the natural life-span of the organism.

This strongly implies that aging, like cancer, is just one more expression of our internal software. As it accumulates more and more errors, especially in the immune system and repair enzyme programmes, the DNA in our cells becomes less fit to deal with the immense job of renewing and controlling our bodies.

Nobody will deny that constant exposure to carcinogens and low level radiation takes its toll on human fitness. In the genetically predisposed individual such injury, as we have seen, can easily result in a life threatening tumor.

In the future perhaps more emphasis should be placed on monitoring and controlling our internal ability to deal with the byproducts of the industrialized world, at the level of the human genome.



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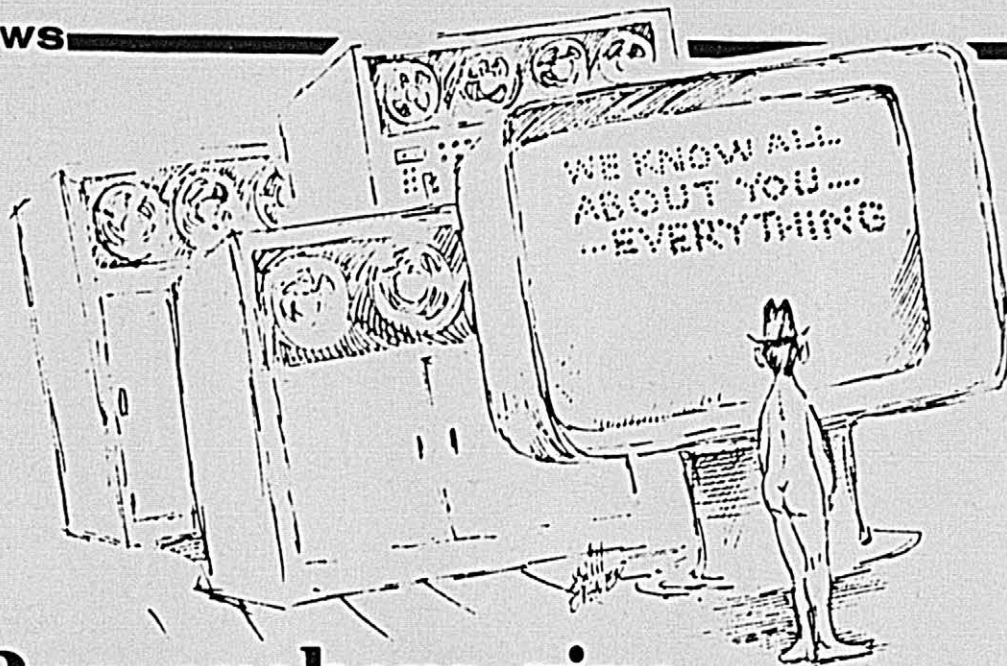
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Researchers give mixed reviews to Tory funding programmes

by John Gushue
of Canadian University Press

Canada's research community has greeted with doubt and hesitancy, the Conservative government's guidelines for a grants programme through which the government would match dollar for dollar money contributed to research by the private sector.

Coming with the federal budget in February, the federal government's announcement states that the three councils that sponsor university research — the Natural Sciences and Engineering Research Council (NSERC), the Social Sciences and Humanities Research Council (SSHRC), and the Medical Research Council (MRC) — would have to raise money from business and industry to earn a major portion of their budgets.

Finance minister Michael Wilson proposed a scheme where the government would contribute a dollar for every private sector dollar raised by the councils. The scheme replaced part of the sustaining grants that the councils were hoping to be awarded.

Early reaction from the research councils was negative enough to prompt the federal government to redesign its matching grant formula. Councils said their staff were barely able to manage daily operations, and could not spare time to solicit private sector funds.

A revised plan announced in July met with more praise. The government has now put the onus on universities to attract funds, and has left the councils to determine which donations are eligible to be matched by the federal government.

NSERC president Art May said the revisions are more to the councils' liking. "Our position is that we support them fully. What's come back is very much as we had hoped it would be," he said.

Louise Dandurand, SSHRC director of policy and planning, said her council's staff is "not pessimistic. We certainly believe we can raise money for some areas of research."

However, she said researchers in the humanities and social sciences are at a disadvantage because their work will not qualify for some tax breaks applicable to other researchers. "The other councils appear to be in a better position than ourselves... The government's fiscal treatment puts us at a disadvantage," she said.

Ross McCormick, vice-president of the University of Winnipeg — which specializes in the social sciences — agreed with Dandurand. "The private sector will likely be more inclined to look favourably upon, and hence fund, applied research and not basic research."

He said that the university may still be able to attract sponsors for some arts-related projects, including ones "that study the implications of technology on society."

Reaction at universities that already house heavy research activity is mixed. Ernie Holmes, dean of research at the University of Waterloo, said that the government's intentions are good, but more direct funding would be better.

"I'm not enthusiastic about the scheme at all," he said. "I don't see that there's going to be much benefit."

Conversely, the University of Toronto is "cautiously optimistic" about the guidelines, according to Geraldine Kenney-Wallace, chair of the university's research board. The university wants a greater emphasis placed on incentives for universities to search for private donations.

Under the existing system the University of Toronto could win a corporate donation, but would not necessarily receive an equal amount of government money if the donation falls within the proposed guidelines.

NSERC president May said the councils will likely continue to use the current system to ensure both regional distribution and excellence in research. He said universities close to industrial centres — such as Waterloo and Toronto — would be more likely to win industrial funding than smaller institutions.

"Lethbridge, Laurentian and Cape Breton deserve funding as well," he said. "There has to be a balance though — some sort of incentive is desirable to encourage researchers."

May agreed that the matching grants system is not a cure to underfunding. "Right now, we're just in a holding pattern," he said.

"In relative terms, it's a good deal. But, of and by themselves, these guidelines do not solve the problems of underfunding in the universities," May said.

letters

To the Daily:

It is an unwritten rule that professors do not write to student newspapers, no matter how outrageous the published statement and how urgent the need for correction. I hope, therefore, that both you and your readers will forgive me for breaking the rule in order to point out some serious factual errors of a scientific nature — errors, moreover, that are repeated almost daily in the media. I refer to the statements concerning the toxicity of plutonium which appeared in the article on "Nuclear weapons in Canadian ports" (Sept. 15).

First Statement: "One millionth of a gram (of plutonium), if inhaled, is enough to cause incurable lung cancer." This assertion carries as much, or as little, credulity as "One cigarette, if smoked, is enough to cause incurable lung cancer" or "One mouthful of food, if improperly swallowed, is enough to cause death through choking." All of these events are possible, but very improbable — about one chance in a million in the case of the single cigarette.

A fairly simple calculation shows that one microgram of plutonium-239 contains about 2.5×10^{15} atoms, of which about 200 disintegrate every second. This means that the activity of this amount of plutonium is about 200 becquerels, one becquerel (Bq) being equal to one disintegration per second. Suppose someone inhales a one microgram speck of Pu and it lodges in a bronchial tube. In these circumstances the so-called "committed dose-equivalent" for the remaining lifetime of the person is about 300 microsieverts per Bq. (The sievert is a unit of radiation dose which takes account of the biological effectiveness of the radiation concerned, in this case

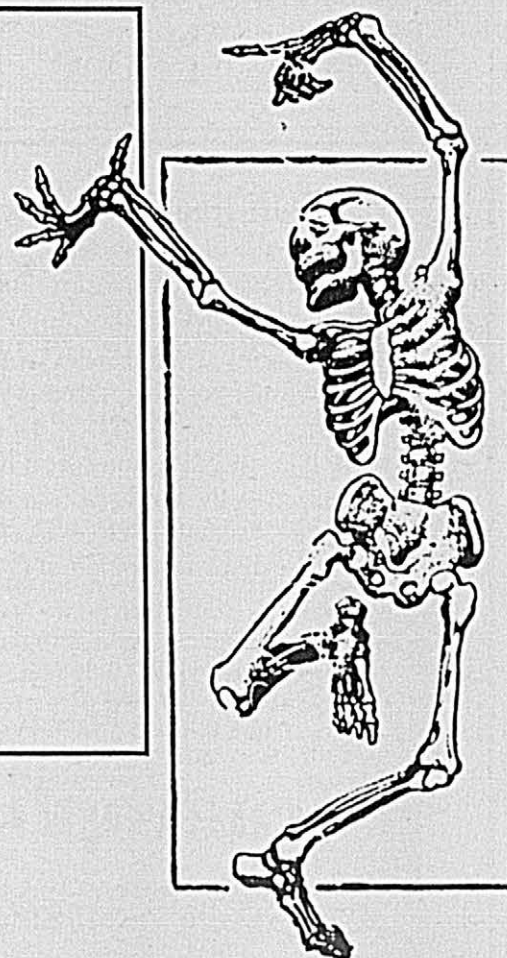
alpha-rays.) Hence the lung receives, over a period of years, about 60,000 microsieverts or 60 millisieverts (mSv). Now the mortality risk for radiation induced cancer of the lung is about 2×10^{-6} per mSv. (These data are all from reports of the International Commission on Radiological Protection.) Hence the mortality risk from inhaling one microgram of Pu-239 is about 120×10^{-6} or about one chance in 8000.

Second statement: "This amount (i.e. five kilograms of plutonium), if properly distributed, is enough to kill every human on the planet." This is untrue — try the calculation with the risk factor suggested above — but, in any case, statements of this kind are meaningless. We might as well say that there is enough water in the St. Lawrence river to drown everyone in Montreal.

Third statement: "Plutonium is one of the most toxic chemicals known to humanity." Of course plutonium is toxic — so are all the heavy metals and radioactive substances — but, in fact, on the usual scale of toxicity (the relative amounts of different poisons which kill half the mammals in an experimental group), it is nowhere near the top of the scale. Radium is four times more toxic and lead arsenate ten times more toxic. Many biological poisons are hundreds of times more toxic than plutonium.

None of the above is intended to minimize the dangers to planet earth of the continuing nuclear arms race. The dangers are real enough, and immediate enough, to be worth confronting without the dubious support of blatant untruths.

Montague Cohen
Director of Medical Physics



events

WEDNESDAY September 24

McGill Black Students' Network general meeting, Union 425-426, 18h30. Info: Union 404.

Uhuru Na Ufumu development areas study group planning 'Issues of Silence,' an educational event to bring attention to issues ignored by mainstream media. Union 410, 18h00. Info: 842-8072.

McGill Women's Union meeting and discussion. Union 423, 18h30. Info: 392-8920.

McGill Medical Student Christian Fellowship video presentation on medical missions in six central African nations. Discussion lead by Dr. Bob Stevens, head of overseas medical missions of Christian Medical Dental Society. All welcome. Task Force on Ethiopian Jewry guest speaker Herb Abrams, Exec. Director of Jewish Immigrant Aid Society, on *Tens of Thousands of Ethiopian Jews Still Need Help*. Hillel House, 3460 Stanley St., 19h00. Info: Mark, 845-9171.

Hillel Institute of Jewish Thought lecture series. Dr. Henry Biberfeld on *Intro. to the Philosophy of Prayer*. Hillel House, 3460 Stanley St., 19h00-20h30. Admission \$8.00. Info: 845-9171.

McGill Alpine Ski Team general meeting. Currie Gym, COTC Lounge, 18h30. All new members welcome.

Political Science Students Assoc. (PSSA) beer and munchies welcome party. Meet your profs and fellow students. Lea 429, 12h00-14h00.

Association des étudiants de science politique (AESP) salle de réception. Lea 429, 12h00-14h00. Rencontre de Bienvenue. Bière et crudités...rencontrez profs et vos confrères.

Alpha Epsilon Psi women's fraternity desperately seeking sisters for an excursion to Peel Pub to discuss the merits of fraternity life. 7-3454 Aymer, 17h00. All welcome. Info: 845-8304.

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A bridge too far

by Michael Finkelstein

Structures have been built and structures have fallen. There are many reasons why a structure falls or fails, and one reason of particular interest to the engineering community is destruction due to resonant vibration.

In 1831, a column of soldiers was marching over the Broughton Bridge near Manchester, England, when the structure began to distort and oscillate. The action intensified until the bridge eventually collapsed.

What was most peculiar to people at that time was that the bridge could normally withstand a force several times that exerted by the weight of the soldiers. It was the pattern with which the soldiers marched and not their combined weight that caused the Broughton Bridge to collapse; as a consequence, to this day, soldiers do not march in step while crossing a bridge.

Until the early nineteenth century, it was felt that the study of vibrations applied only to the movement of air inside musical instrument. The first to suggest that vibrational analysis could be of more importance was Dr. Thomas Young; in a set of lectures given at the Royal Institution, he suggested that vibrational analysis might have more significance.

With time thorough scientific analysis revealed more details concerning natural frequencies. Towards the middle of the last century, it was discovered that any entity which has mass and elasticity can vibrate and have at least one natural frequency. This natural frequency is determined by the geometry and mass distribution of the object.

Any body that is subjected to a force which oscillates at that body's natural frequency will experience relatively immense displacements. This is an accurate description of the effect of the soldiers marching over the Broughton Bridge.

Another fairly spectacular example of a bridge collapsing due to resonant excitation is the infamous Tacoma Narrows Bridge incident at Puget Sound, Washington, in 1940.

When a mild gale wind, with a fluctuating force resonant with the

natural frequency of the bridge, blew over the structure, the bridge's main span began to twist and oscillate, not unlike the movements of a wave running threw a skipping rope. Concrete beams oscillated at amplitudes of several feet until the bridge finally disintegrated several hours later.

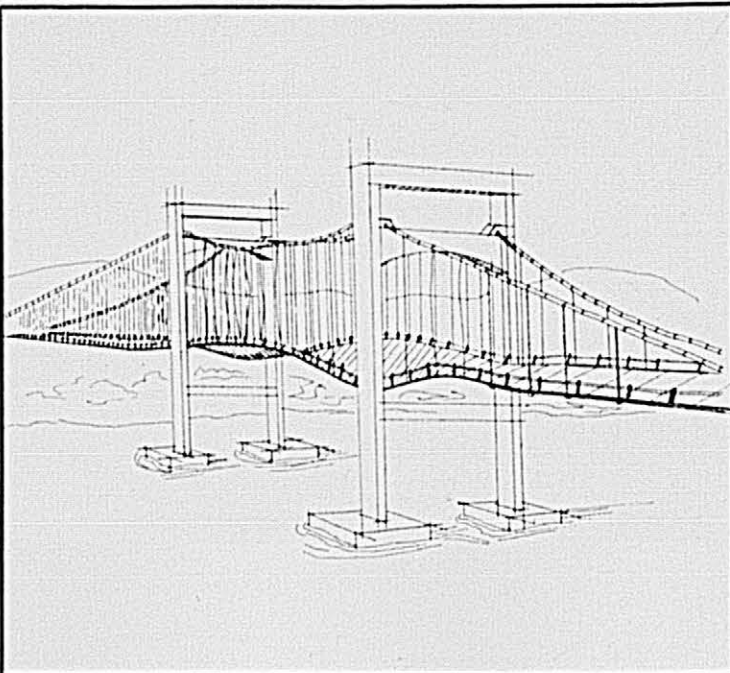
Once again, this bridge had been designed to withstand forces many times greater than that exerted by the wind. Here, the problem lay in the speed with which the wind blew. Had the wind blown more quickly or more slowly, this accident could probably have been avoided, at least until another gale passed at the bridge resonant frequency.

Vibrational destruction is in no way a problem restricted to bridges. Airplane wings, car suspensions, buildings, win-

can be damped. Usually, this involves integrating a part with minimal elasticity into the structure; such as a shock absorber installed in a car's suspension.

Oscillation problems in structures can also be solved using a vibrational absorber. Essentially, this is a spring and mass attached to the main structure. A weight, whose mass is calculated from the geometry and mass of the main structure, hangs on the ends of a spring, whose properties are similarly calculated. In conditions when the structure would normally oscillate at its natural frequency, the motion is transferred to this hanging weight.

For very large structure, such as the half mile Tacoma Narrows Bridge, the task of avoiding disaster is optimally incorporated in



dowpanes, and even the human body are susceptible to environmental resonant excitation.

The effect of vibrations on an otherwise sturdy construction can be devastating. Thus the determination of a structure's natural frequency, and a study of the working environment, is critical when a structure is designed.

There are many tools often used by engineers to circumvent vibrational problems. These tools dissipate the large quantities of energy brought about by resonant excitation through various means.

In certain situations, the vibration

the original design. Most importantly, long slender bridges more readily end in such disasters. As well, mixtures of different building materials — wood, concrete, metal and so on — alter the natural frequency and make a harmony of frequencies less likely.

A great deal more is known now than in 1831 or in 1940. Just as the Broughton Bridge disaster scared soldiers into never marching in step across a bridge, the Tacoma Narrows disaster became every engineer's nightmare, inspiring magnificent works of preventive design.

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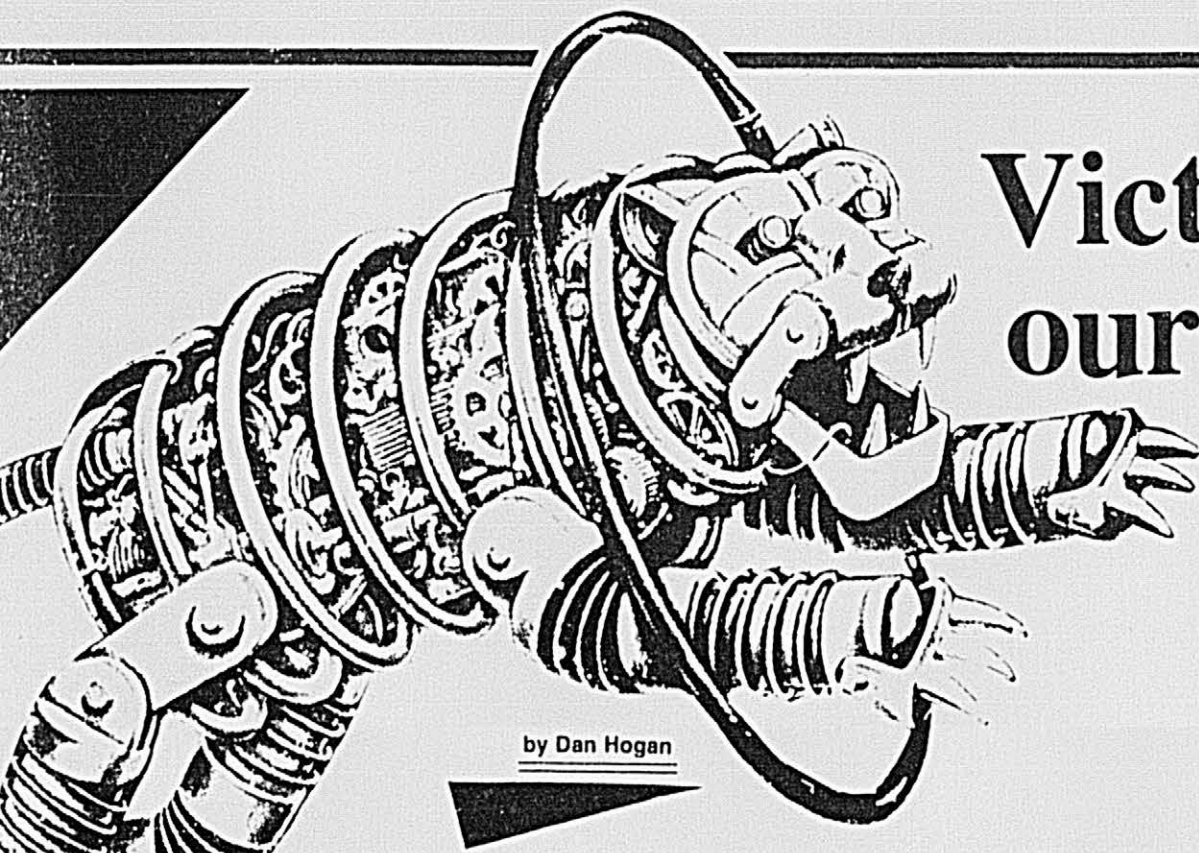
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by Dan Hogan

Victims of our own devices?

The world around us is exploding. Everyday we are bombarded with news reports: terrorist attacks, volcanic eruptions, seismic sensations. All of these deal with sudden events. But since the dawn of the computer age, we have been experiencing another kind of explosion, far more gradual and yet far more extensive in its effects — the Information Revolution.

As early as 1960, machines outnumbered people five to one in the United States alone. Today this figure is much higher, largely as a result of the rapid advances in information technology. Yet most of us are relatively unaware of the huge role that computer-based devices now play in our daily lives.

We are even less aware of the social consequences of these new machines. What are the trends that shape our attitudes towards this new technology? And how can a

better understanding of these trends help us ensure that humankind's latest tool is used wisely?

These questions are being addressed by two of Canada's leading experts on 'the Information Society' at Montréal's GAMMA Institute: Dr. Scot Gardiner (author of *The Person and the Machine: Papers on the Human Impact of Electronic Technology*, GAMMA Publications, 1984) and Dr. Kimon Valaskakis (founder and president

of the Institute).

Their work constitutes part of GAMMA's ongoing *Information Society Project*. Its objectives are to carry out detailed research on the inter-relationships inherent in the Information Revolution and to inform Canada's policy-makers of the challenges and opportunities we must face.

How have people viewed the introduction of the new information technologies into their daily lives? Dr. Gardiner points to two opposing trends: *technophobia* versus *technomania*. In the first case he attributes the public's initial resistance to computers to the overwhelmingly complex and often cryptic set of instructions required to programme them. "A suitable analogy can be found in the early days of the automobile," he said. "You practically had to be a mechanic simply to operate it."

Fundamentally, technophobia probably stems from a more general fear of novelty and change. This *neophobia* is directly related to an individual's ability to adapt to a new environment.

"Older people often tend to be set in their ways and have a more difficult time accepting new technologies, thus becoming technophobic," Dr. Gardiner elaborated. "Younger people on the other hand do not seem to suffer from this affliction and can easily jump right into the computer world."

This natural adaptive facility of the youth along with their sometimes insatiable curiosity for technological innovations have helped to contribute to the establishment of the opposite trend — *technomania*. The symptoms are all too familiar: addiction to video games, rejection of human contact, even as Dr. Valaskakis says, 'reality blur' caused by living in a world of electronic illusions.

Not only children suffer from these symptoms. An increasing number of adults are being swept along with the current computer rage. As many new information technologies become more advanced, they actually become simpler to use. Today's automobile, for example, has a mind of its own. It can automatically maximize engine efficiency, maintain constant cruising speed, display moving road maps, and tell you when the door is ajar.

Machines can thus adapt to our needs and become more 'user-friendly', thereby reducing technophobic tendencies in adults.

Dr. Valaskakis points out that increasing familiarity with electronic technology is leading to a greater overall trend towards *technomania* among young and old. One obvious implication is increased personal dependence on high-tech.

"The individual vulnerability caused by overdependence on machines brings with it a collective vulnerability which affects us all," he explained.

There are several examples in which humans could become victims of their own devices. A computer-controlled car could, for instance, trigger the anti-skid system at the wrong time, resulting in tragedy. Or perhaps we could become victims of unauthorized computer-mediated transactions, losing all our financial savings in one fell swoop. There is even the ominous possibility that nuclear war could be accidentally initiated if a computer misinterpreted a flock of passing geese, say, as a salvo of enemy missiles.

Although no one can accurately

measure the probability of any of these events, we must realistically acknowledge the fact that computers can make wrong decisions even, as Dr. Valaskakis says, "with the best intentions."

But assuming that our dependence on new technology does not lead to disaster, what does the future have in store? Three scenarios have been sketched so far.

The *télématique* scenario envisions a completely 'wired' society hooked up to a 'central electronic highway'. Another possibility is the *privatique* scenario in which a decentralized society is plugged into personal computers. Lastly we have the *rejection* scenario where, as Marshall McLuhan once predicted, information-overloaded consumers would try to curb runaway technology.

Our real future will probably be some mixture of these three possible worlds. Furthermore, the final outcome will, to a large degree, depend on how our individual attitudes influence our collective actions or inactions.

How do we ensure that these actions are based on our collective reason and not merely on technophobic or technomaniac attitudes? Dr. Valaskakis recommends developing effective means of consultation and cooperation among our decision-makers including those in government, business, and labour. Countries such as Japan, Austria, and Switzerland have successfully employed such multi-lateral efforts in the implementation of new technologies.

Furthermore, social issues such as job security, preservation of democratic freedoms and personal privacy must be addressed at all levels in order that we can make the transition to an Information Society without devastating consequences.

Both *technophobia* and *technomania* are trends which we must avoid since one is based on irrational fear and the other on blind obsession. Such tendencies can only cloud the complex issues of the Information Revolution and detract from an objective evaluation of its many facets.

Fortunately, nature has provided us with the most advanced piece of information technology known — the human brain. Let us hope we can use this machine wisely.

Adapted from an article in Canadian Student Pugwash's quarterly newsletter, Pugwash (Vol.3, No.1, Fall).

The GAMMA Institute is located on 3764 Côte-des-Neiges, Montréal, PQ, H3H 1V6 (phone: 937-2212).

Ecstasy by design

at. In the 1950's the United States d it on animals as a prospective c compound with military use. In doses it proved lethal to monkeys The Army claims that the drug was d on humans.

70's the drug resurfaced when a therapists began to recommend it nct to therapy.

belled as a psychedelic drug, but re comparing the subjective effects pound to those of the classic c drugs such as LSD, psilocybin, or dimethyltryptamine did not port the placement of MDMA in ry.

g to some clinical reports, MDMA in a controlled environment with ervation, does not produce the ts as more powerful psychedelics ntation, ego disruption, perceptual and transient psychotic states. y, subjects describe an nt in mood and ability to ate in individual and group apy. They also experience an ntrospective ability.

asearchers indicated the drug t medical value for patients om schizophrenia, depression, ion, and anxiety. However, a adverse side effects have also ed which include, nausea, lurred vision, as well as s in heart rate and blood pressure. rly 1980's, extravagant claims t that MDMA could cure mend marriages, and even world peace! Thus the name t reportedly had the euphoric rush

of cocaine as well as some of the mind-expanding qualities of hallucinogens without the frightening visual distortions.

Word spread of the new, apparently harmless, legal 'LSD of the eighties.' Its use increased so dramatically in the summer of 1984, that the United States Drug Enforcement Agency (DEA) officials undertook emergency measures to stem its use.

On July 1, 1985, MDMA was placed on DEA schedule I with heroin and LSD. Schedule I is a category for drugs which are considered to have a high potential for abuse and no accepted medical use. This made trafficking in MDMA punishable by 15 years in prison and a \$125,000 fine.

In addition to their concern about the increase in the street use of MDMA, DEA officials were worried that chemical similarities between that drug and Methylenedioxymphetamine (MDA), another schedule I drug, implied that the two had similar effects. An unpublished study reported that MDA induced the degeneration of serotonergic tissue of the central nervous system.

A more recent study, which used MDMA, showed that it has an effect on tryptophan hydrolase activity in the rat brain. The enzyme tryptophan hydrolase is one of the rate limiting enzymes for the synthesis of the neurotransmitters dopamine and serotonin. However, it should be noted that even in the best of circumstances, establishing a direct causal relationship between the use of a psychoactive drug and the subsequent 'adverse reactions' is difficult.

It is interesting to note, as well, that another recent study has shown that in sharp contrast to the happy sociability which many

users describe, MDMA appeared to disrupt, rather than facilitate, social interaction in adult primate (stumptail macaques) social colonies.

While researchers agree that the drug needs to be regulated, many believe it should be placed on the less restrictive schedule III, which allows medical use and research. This has prompted many of researchers to call for the DEA to hold administrative law hearings concerning the classification of MDMA as a schedule I substance.

These hearings are now in progress and will not be completed until next year.

Many researchers hope that the furore in the media which made research with psychedelic drugs so difficult in the 1960's will not have the same effect on further rational enquiry into the mechanisms of action and clinical uses of MDMA.

Even though MDMA is now illegal, street sales in the United States are not expected to drop significantly. What will suffer, however, is the chemical purity and distribution system. The production of MDMA is now restricted to underground laboratories which often lack stringent quality controls that assess the drugs purity.

Four years ago a poorly made batch of a heroin-like designer drug called MPTP resulted in users developing a paralytic syndrome similar to Parkinson's Disease.

In Dallas, Texas, dealers report that the local organized crime network has set up production facilities which will keep the city supplied with Ecstasy. And, of course, the search is also on for new designer drugs which can be sold legally on the street.

Indeed there are now reports of a new but somewhat milder drug called EVE which may eventually replace MDMA.

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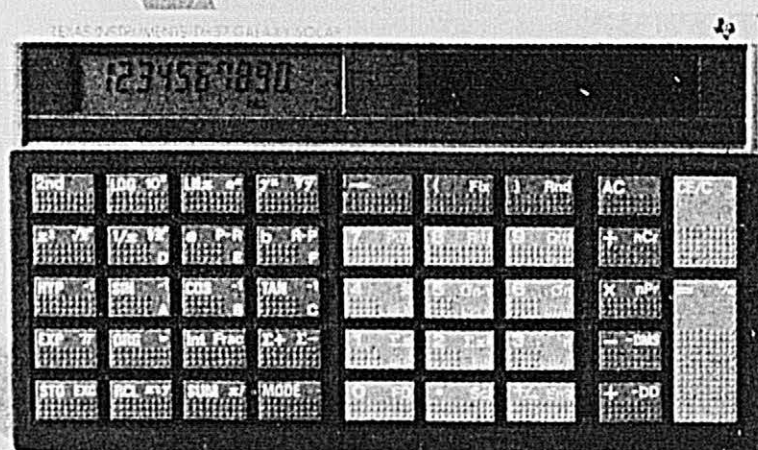
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McGill students: \$2.50 per day; for 3 consecutive days, \$2.00 per day; more than 3 days \$1.75 per day. McGill faculty and staff: \$3.50 per day. All others: \$4.00 per day. Exact change only, please.
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Yamaha clarinet, Van Doren V360, Yamaha Y21. Old but good condition. Methods by Klosé, Périé. Please call between 5:30 and 7:30 pm. 849-8724. Ask for Danièle.

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Roland keyboard with case, organ / strings rarely used. Paid \$750, sell for \$475 / o.b.o. Jon 931-8553, leave message.

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Physics textbooks, 2nd edition by Douglas Giancoli. If you are willing to part with this gem for a reasonable price please phone Laura at 845-7778

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LOST - a red cashmere plaid scarf on campus Wednesday September 17. Very dear to me. Reward offered. Call 281-6319.

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Give us a McCall tonight. McGill McNightline 392-8234. Monday - Friday 9 p.m. - 3 a.m.

I am a goaltender looking for a team. Preferably "A" but willing to play "B" if you've got a team but no goalie. Call me: 931-9144.

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Mountain cycle tours Green Mountains, Vermont. Friday to Sunday (Sept. 26-28) or (Oct. 3-5). Catered meals. Price: \$160. Includes meals and lodging. 934-1465.

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Looking for any ex-Outlaws or McConnell Mashers to play girl's intramural hockey again this year. Lots of fun, newcomers welcome. Call Carrie 281-6591.

Come one, come all! The first meeting of Americans Abroad will take place on Thursday, September 25 in the Union Bldg. Room 410 at 7:00 p.m. Everyone Welcome!

387 - VOLUNTEERS

Outsiders wanted for insiders. Volunteers wanted to work inside prisons sharing cultural and social activities with the detained. Interesting and rewarding. One evening weekly. 663-2496.

McStar search is looking for you!!! Those willing to expose any latent talent please contact Bill day 392-8910 evening 392-8963 or 8964. Cash & prizes, fame and infamy.

Montreal Neurological Hospital: Volunteers required for Positron Emission Tomography research with remuneration. If interested call 284-5830 or 284-4588 from 9 am - 4 pm.

Montreal Neurological Hospital. The student volunteer programme has begun. If you wish to join, do so by phoning John Hale, 288-0463, before Sept. 26.

389 - MUSICIANS WANTED

Musicians (bands, singers, etc.) needed to play at Deke pub on Tuesday nights. Call François at 286-1624 or 392-4510, or drop by at 3653 University (blue door).

Experienced & Equipped keyboardist wanted by part-time rock band. Please call Mike at 485-2609.

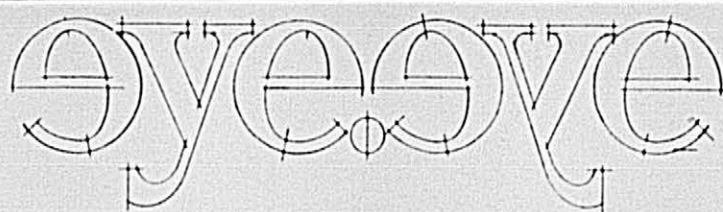
Guitar player seeking musicians to form or join band. Diverse taste by mainly blues/rock (covers and originals). Play rhythm and lead. Fully equipped. Call 288-2918, ask for Rich.



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Late registration is now underway.
Places are still available in some
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Social Dance
Wed. 20:30 - 22:00

Fitness

Action Aerobics
Mon. & Wed. 16:00 - 17:00

Racquets

Tennis (Rockland Sport)
Fri. 15:00 - 17:00

Varia

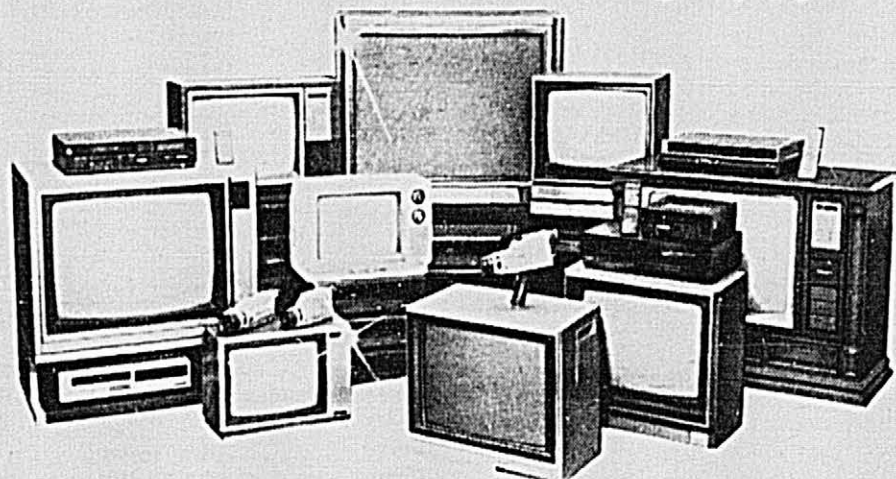
Hockey I
Tue. 14:00 - 15:15
Hockey II
Tue. 15:15 - 16:45
(starts Oct. 7)

Aquatics

Synchro Swim
Mon. & Wed. 19:45 - 21:00
National Lifeguard
Wed. 18:30 - 22:45

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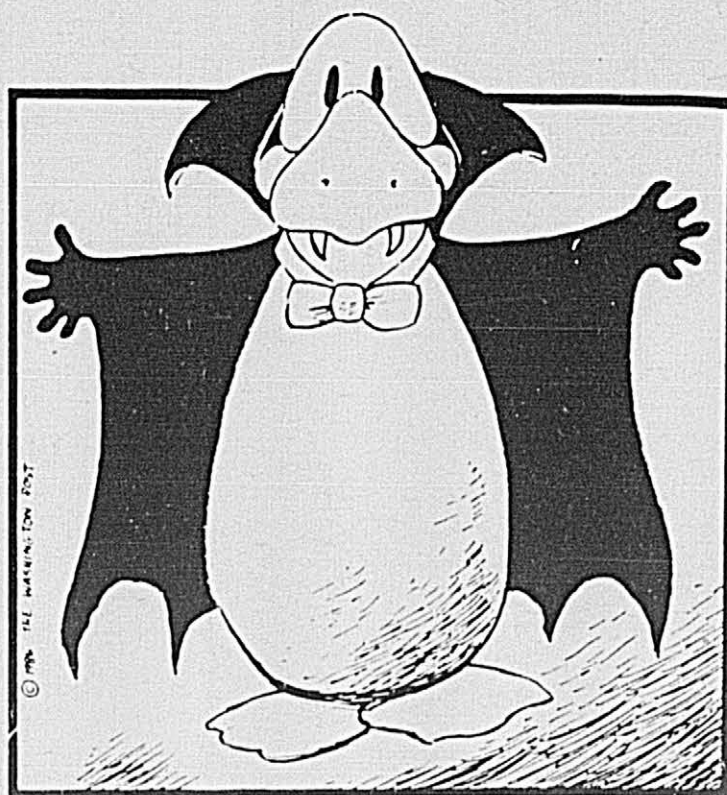
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